Do Others Perceive You As You Want Them To? Modeling Personality based on Selfies

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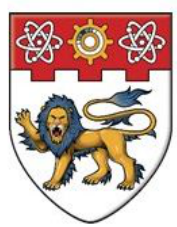

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Defining the Problem

Modeling Users' Personality based on Selfies

Given selfies of users,
can their personality be modeled?

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Challenge in Personality Modeling

Appropriate platform for self-expression and freedom of control, which are necessary cues for personality to be strongly expressed [1]

[1] S. D. Gosling, S. J. Ko, T. Mannarelli, and M. E. Morris. A room with a cue: personality judgments based on offices and bedrooms. Journal of personality and social psychology, 82(3):379, 2002.

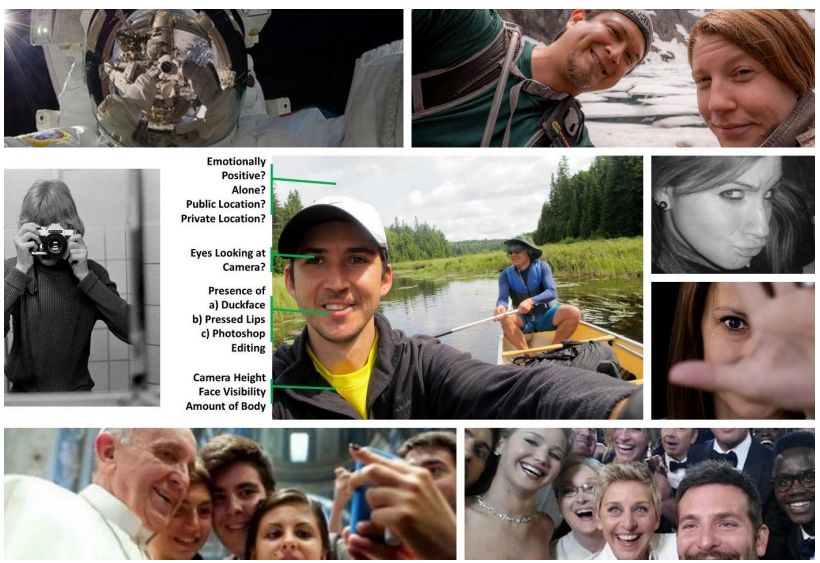
Defining the Problem

Our Contribution

- Train models to detect mid-level cues (which are relevant to personality prediction based on psychology literature) in selfies, using low-level visual features.
- Automatically predict users' personality using the trained mid-level cue detectors.
- Present several insights on which mid-level cues contribute to personality recognition and personality perception.

Data-set crawled: selfies of 123 users from a microblogging website (Sina Weibo), with self-assessed BFI-10 traits and others-assessed traits (rated by 8 RAs from Dept. of Psychology).

Defining the Problem



'I want you to think that I am cool and trendy! Let me put a duckface to convey this'

What you want others to perceive about you

Personality Recognition

'Ewww! Looks like neurotic person!'

What others actually perceive about you

Personality Perception

Selfie → Visual Features → Mid-Level Cues

Images Source: Flickr CC and https://www.pinterest.com/LokidByLoki/angry/

Selfies are a great medium of self-expression: Users can control what is in the selfie.

Related Work

- Works using facial images from Facebook[1], random portraits on the web[2] and existing face recognition datasets [3]
- Face recognition datasets and random portraits may not be the right platform for self-expression and freedom of control - necessary for personality expression.

[1] F. Celli et. al. Automatic Personality and Interaction Style Recognition from Facebook Profile Pictures. ACM Multimedia, 2014.

[2] J. Nie et. al. How your portrait impresses people: Inferring personality impressions from portrait contents. ACM Multimedia, 2014.

[2] N. Al Moubayed et. al. Face-based automatic personality perception. ACM Multimedia, 2014.

Mid-Level Cues detected from Selfies

Mid-Level Cue	Label Description
Face Visibility	Not Visible/Partial/Complete
Photoshop Editing	Present/Absent
Public Location	Yes/No
Private Location	Yes/No
Duckface	Present/Absent
Pressed Lips	Present/Absent
Emotional Positivity	Negative/Neutral/Positive
Alone	Yes/No
Amount of Body	Face Only/Shoulder-up/Waist-up
Eyes Looking at Cam.	Yes/No
Camera Height	Below/At/Above Head-level
Camera In Front	Yes/No
Gender	Male/Female
Age	Below 18/18-20/21-25/Above 26

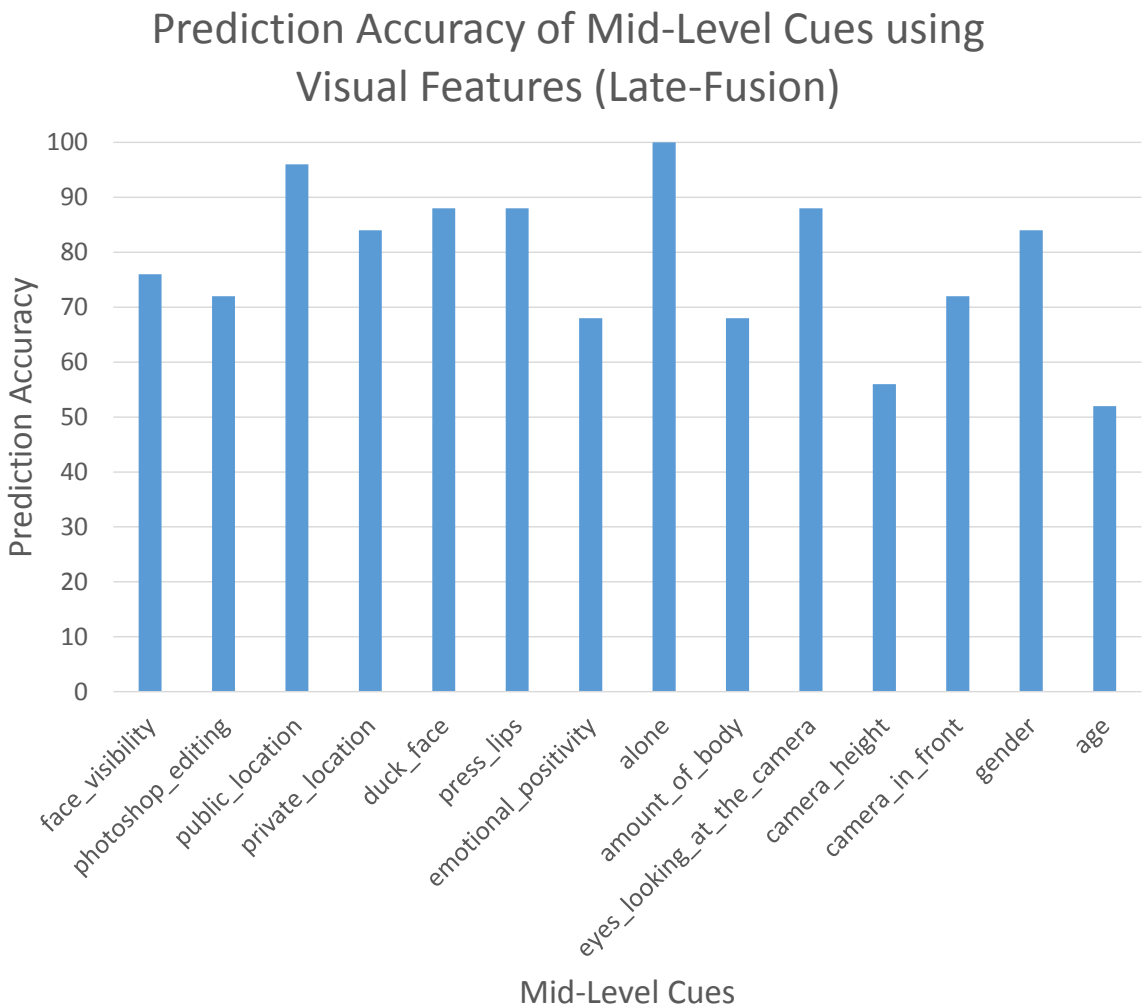
Annonations provided by 2 raters (90.81% inter-rater agreeability ($p < 0.001$)).

Learning Mid-Level Cue Detectors

Features extracted

- Extracted 10 visual features: Color Histograms, Aesthetic Features, GIST, LBP, Attribute Features, BoVW, Fisher Encoding of SIFT.
- SVM Models are trained (5-fold cross validation on 75% data) to predict mid-level cues (testing on 25% data).
- Output of mid-level detectors are used as features to predict scores on personality (both self-assessed and others-assessed).

Learning Mid-Level Cue Detectors

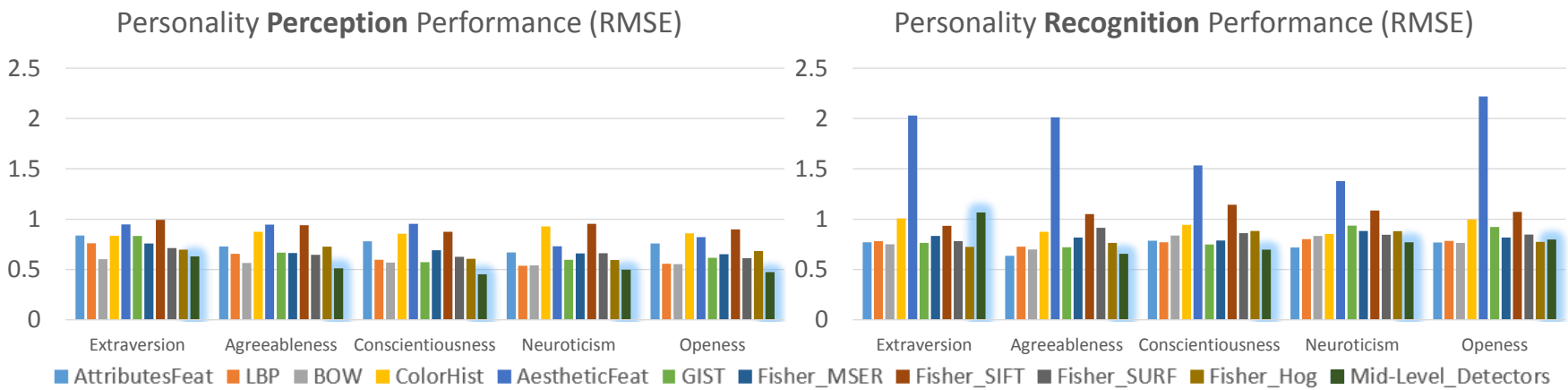


Learning Mid-Level Cue Detectors

Some observations for mid-level cue detections

- Cues such as alone and public_location are detected with $> 75\%$ accuracy.
- Other cues need specific features - pressed_lips best detected by LBP, emotional_positivity by aesthetic features.
- Age and camera_height have least performance due to the complexity of detection and absence of specific features to detect pose respectively.

Predicting Personality



Performance (RMSE) of various features at predicting personality scores. Mid-level detectors outperform other features at predicting most traits.

Predicting Personality

Some observations for presonality prediction

- Mid-level cues outperform individual visual features in most of the traits. They outperform LBP and SIFT,HoG (Fisher encoding) which are used in previous works.
- Lower performance in personality recognition when compared to personality perception might be due to users' exaggeration of expressions, which might be visible to a person perceiving users' personality.
- Most selfies posted on social media have smiling users with a positive look, thereby reducing the diversity of the self-presentations. This bias might be another reason for higher performance on personality perception.
- Aesthetic features perform very poorly for personality recognition.

Corr. b/w Mid-Level Cues and Personality

Significant Correlations ($p < 0.01$) b/w Self-Assessed Personality Traits and Mid-Level Cues

Self-Assessed trait	Significant Cue	Correlation
Extraversion	-	-
Agreeableness	Emotional Positivity	0.18
	Camera Height	-0.20
Conscientiousness	Private Location	-0.20
Neuroticism	Duck Face	0.21
Openness	Emotional Positivity	0.22

Corr. b/w Mid-Level Cues and Personality

Significant Correlations ($p < 0.01$) b/w Others-Assessed Personality Traits and Mid-Level Cues

Others-Assessed Trait	Significant Cue	Correlation
Extraversion	Pressed Lips	-0.19
	Emotional Positivity	0.29
Agreeableness	Emotional Positivity	0.50
	Eyes Look at Camera	0.24
Conscientiousness	Duck Face	-0.31
	Emotional Positivity	0.25
	Location Information	0.30
	Public Location	0.25
	Photoshop Editing	-0.20
Neuroticism	Duck Face	0.25
	Emotional Positivity	-0.40
	Face Visibility	-0.21
	Amount of Body	-0.22
	Alone	0.22
	Location Information	-0.19
Openness	Emotional Positivity	-0.22
	Eyes Look at Camera	0.21
	Face Visibility	-0.26

Discussion

Self-assessed Personality

- Agreeableness negatively correlated with camera height.
- Conscientiousness negatively correlated with private location.
- Neuroticism positively correlated with duckface.
- Extraversion was not significantly related to positive emotional expression, contradictory to previous psychology findings. One reason could be that users, irrespective of their degree of extraversion, tend to show positive emotion in selfies to maintain positive self-impression.
- Openness positively correlated with emotional positivity, which was not observed in previous findings.

Causality between behaviors and personality traits cant be verified by this study

Discussion

Others-assessed Personality

- Extraversion negatively correlated with pressed lips, possibly because its seen as a symptom of shyness.
- Agreeableness was positively correlated with eyes looking at camera, supporting the psychology finding that users who had eye contact are seen as more agreeable.
- Neuroticism positively correlated with duckface and negatively correlated with face visibility, possibly indicating that showing a full duckface implies that the user is moody.

Causality between behaviors and personality traits cannot be verified by this study

Conclusion

- We built mid-level cue detectors for selfies by exploiting several visual features which were then used to model users' personality.
- We attempted to understand selfie-taking behaviors of users based on their personality and how others would perceive the users based on their selfies.

Future Work

- Comparing how reliable selfies are at personality prediction when compared to other photos.
- Exploring the degree of exaggeration that users exhibit wrt different mid-level cues (for e.g. if a user is posing in a duckface to an extent that it looks awkward vs. otherwise).
- Building a bigger and broader dataset.

Thank you!
Any Questions?